

Report on the National EAS Test On-line Survey and Focus Group Findings

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Report on the National EAS Test On-line Survey and Focus Group Findings conducted by the Wireless RERC

EXECUTIVE SUMMARY

The Rehabilitation Engineering Research Center for Wireless Technologies (Wireless RERC) is funded by the National Institute on Disability and Rehabilitation Research of the U.S. Department of Education. Our mission is to research, evaluate and develop innovative wireless technologies and products that meet the needs, enhance the independence, and improve the quality of life and community participation of people with disabilities. We believe it is essential that the needs of persons with disabilities be an intrinsic element in the implementation of emergency alerts, communications and procedures. Since 2004 the Wireless RERC has been actively involved with research, regulatory issues and development of wireless technologies concerning accessible alerts and emergency communications.

From November 2, 2011 through November 18, 2011, the Wireless RERC conducted two surveys, one prior to the November 9th national EAS test and the other following the test. Four hundred and three (403) people responded to the pre and post-EAS test surveys. The surveys evaluated responses from people who are deaf, hard of hearing, blind or have low vision in order to understand the effectiveness of EAS for people with sensory disabilities. In addition, on November 9th during the actual tests, 22 people with sensory disabilities participated in focus groups held at Public Broadcasting Atlanta (PBA). Thirty-five (35) states were represented in the surveys and focus groups.

There were 19 questions asked in the pre-EAS survey and 12 in the post-EAS survey. The focus groups watched or listened to Atlanta's NPR and PBS stations, WABE 90.1FM and PBA30TV, and discussed the effectiveness of the EAS as a way to alert people with disabilities

in the case of national emergencies. Each group was presented with nine questions for discussion.

Eighty-one percent (81%) of respondents had heard of EAS and 82% were aware of the November 9, 2011 national EAS test message. The top four sources where people received notice of the national EAS test were from e-mail, television news or public service announcements, and from organizations that serve people with disabilities. Seventy percent (70%) of respondents to the survey had heard or seen an EAS message on television or radio prior to the national test. While 64% of respondents reported no problems with EAS messages delivered via television or radio, 36% of individuals reported a variety of problems. Some of the access barriers for those who had sensory challenges included: the television broadcasts were inconsistent in their use of audio; there was no audio accompanying the TV crawl; the text crawl was too small and too fast to decipher; the radio and television broadcasts of the alerts was of poor quality; the attention signal was not in a frequency the hard-of-hearing can hear; there was no visual alert mechanism such as a flashing screen; and there was a lack of awareness of accessible options, for example NOAA weather radios and the forthcoming Commercial Mobile Alerts System (CMAS).

The nationwide test of EAS revealed technical, policy and practice related challenges. Technically, as evident from both the national EAS test focus groups and on-line survey results, the EAS alerts via television broadcasts were inconsistent in their use of audio and therefore not reliably accessible to people with visual difficulties. Respondents and participants with hearing loss also found that the national EAS test message was not fully accessible, reporting problems with the attention signal and audio quality. Regarding policy and practice, the voluntary nature of the system resulted in the inconsistent implementation of the rules and regulations regarding state and local participation in EAS. While we realize the nationwide EAS test was created to evaluate the effectiveness of the system, it served to highlight that there were inconsistencies in delivering the message.

Following are the recommendations from the Wireless RERC for improving the accessibility of EAS delivered over television and radio:

- Always provide audio and visual formats of alert content for all types of alerts (weather, Amber, presidential, free text).

- Standardize the appearance of EAS messages.
- Incorporate pre-recorded or rapidly assembled ASL video translation of message content.
- Include a visual alert mechanism such as a screen flash.
- Reduce the speed of the text crawl.
- Increase the size of the text crawl.
- Improve audio voice quality.
- Interrupt regular programming to accommodate a full screen alert.

The on-line survey and focus group results are detailed in the following pages, including profiles of the participants; accessibility issues that were raised regarding receipt of the tests via television, radio, cable; qualitative and quantitative information gathered from the November 9th focus groups; and conclusions and recommendations which we share with the FCC, its partners on the national test, and other stakeholders.

INTRODUCTION

On November 9, 2011, the Federal Emergency Management Agency (FEMA) in collaboration with the Federal Communications Commission (FCC) conducted the first-ever nationwide test of the Emergency Alert System (EAS). A 30 second test message was sent via the FEMA Primary Entry Point (PEP)¹ system to EAS participants nationwide. As reported by the FCC, the test message was received by 88% of the EAS participants across the country. EAS participant broadcast stations, cable systems, satellite program providers, National Public Radio (NPR) and other public information services transmitted the message to the public. NPR provided a valuable service by transmitting the message to areas not covered by FEMA's PEP system. Unofficially, as reported by the popular press, some states reported 100% participation by their EAS participants.

Television stations and cable systems transmitted an on-screen slide just before the test to announce that the following message would be a test of the EAS and not an alert. However,

¹ A PEP station is a relay point for disseminating EAS messages; 61 PEP stations (TV and radio broadcasters) were used for the national EAS test.

some television stations and cable systems were unable to access the test message and consequently returned to normal programming.

Challenges were reported during the test. For example, the audio portion of the message started according to procedure even though it had a time stamp three minutes in the future. A feedback problem in the PEP system caused the audio message to become distorted shortly after it began. These problems caused some EAS equipment to terminate the message early and caused other EAS equipment to not send the message to downstream participants. Nonetheless, the first-ever national EAS test provided valuable technical information to the government and the EAS community to correct the technical problems and strengthen the system.

The test was designed to gather test result data from EAS participants and feedback from all stakeholders. The FCC was charged with gathering participant data and FEMA issued a statement requesting stakeholders to share feedback about the tests in their viewing areas². The Wireless RERC in support of the goals of the national EAS test commends the FCC and FEMA for seeking comments of stakeholders in this process, and hereby submits comments on the accessibility of this first national test.

BACKGROUND

Since the creation of EAS in 1994, people with sensory disabilities, organizations that advocate on their behalf and academics conducting research on disability access to technology have submitted recommendations to the FCC intended to enhance the accessibility of EAS. These efforts increased after the September 11, 2001 events and the hurricane seasons that followed. In 2005, a major shift occurred when the FCC amended their rules “to ensure that persons with disabilities have equal access to public warnings.” For nearly a decade the Wireless RERC has conducted research and development projects dealing with the accessibility of emergency communications, emergency alerting, EAS, CMAS, communications with 9-1-1 services, and E-9-1-1. The Wireless RERC has been active in filing comments in federal rulemakings to promote the inclusiveness and accessibility of EAS and all emergency communications activities for people with disabilities. In particular, the Wireless RERC has

² See FEMA FCC EAS Post Test Letter November 10, 2011, available at ipaws@dhs.gov.

recommended that participation in EAS be made mandatory at the state and local level. This is especially crucial for imminent threat warnings such as for tornados, tsunamis, flash floods and public evacuations. Obligatory activation of EAS when imminent threats are present would allow for the FCC to promulgate rules that would not only modernize the system, but make the delivery of EAS message formats consistent across the United States. Further, to successfully address the accessibility of EAS it is essential that all EAS message transmissions be consistent in their use of high quality audio. The increased use of wireless devices among the public also indicates the importance of national testing of CMAS messages to ensure that they, too, are accessible. This report focuses on the national EAS test, which provided a unique opportunity to gather data by on-line survey and also real-time reactions on how people with sensory disabilities experience EAS to set a baseline for future data we plan to gather on CMAS accessibility in 2013.

METHODOLOGY

From November 2, 2011 through November 18, 2011, the Wireless RERC conducted two surveys, one prior to the November 9th national EAS test and the other following the test. The surveys evaluated responses from people who are deaf, hard-of-hearing, are blind or have low vision in order to understand the effectiveness of EAS for people with sensory disabilities.

Convenience sampling was used for participant recruitment. A total of 403 people responded to the pre and post-EAS test surveys; 229 respondents for the pre-test and 174 for the post-test. The survey was offered online and via telephone. Participants were recruited using several methods, including direct e-mail invitations, posts on social media websites, announcements in publications such as the Deaf News Network, and through select federal agencies outreach networks. Members of the Wireless RERC's Consumer Advisory Network (CAN), a national network of more than 1000 people with disabilities and other functional and access needs were invited to take the survey. Participant recruitment was also facilitated by staff from the American Association of People with Disabilities, Benton Foundation, Georgia Emergency Preparedness Coalition, Georgia Radio Reading Service, and the Hearing, Speech and Deafness Center.

In addition, 22 people with sensory disabilities participated in focus groups held at Public Broadcasting Atlanta (PBA). The participants were recruited from the CAN, the Hearing Loss

Association of America and the Georgia Radio Reading Service (GaRRS) listeners. They were divided into three groups:

- Deaf and hard-of-hearing (10) that discussed the televised EAS test message;
- Blind and low vision (6) that discussed the televised EAS test message; and
- Blind and low vision (6) that discussed the EAS test message delivered over the radio.

After listening to and/or watching the on-air EAS test message, focus group facilitators led a 90 minute discussion that addressed any problems the participants experienced receiving and understanding the message. Each group was given nine questions to help stimulate discussion in some of the following areas:

- Noticing an alert was occurring;
- Hearing the attention signal;
- Hearing the audio message;
- Seeing and understanding the video (crawl) message;
- How EAS messages could be improved;
- Problems encountered with EAS messages outside of the national test;
- Alternative emergency alerting methods/technologies; and
- Behavioral reactions to EAS messages (i.e. followed instructions, ignored, sought additional information, etc.)

NATIONAL EAS TEST PRETEST SURVEY RESULTS

DEMOGRAPHIC PROFILE

To maintain consistency with previous surveys conducted by the Wireless RERC, respondents are always asked to self-identify for all categories of disability: sensory, speaking, dexterity, mobility and cognitive. In doing so, we also acknowledge that some respondents have more than one disability to report. However, the discussion of this research in later sections of the report will focus on the data gathered from respondents who are blind, have low vision, are deaf or hard-of-hearing.

Table 1 portrays the type of disability by percentage. Two-hundred twenty-nine (229) people completed the pre-test survey. The majority of survey respondents, 88%, self-identified as having difficulty hearing (49% deaf and 38.6% hard of hearing). Twenty-eight percent (28%)

self-identified as having difficulty seeing (11.4% with low vision and 16.2% blind). The average age of survey respondents was 51; the oldest was 81 and the youngest 18. Three percent (3%) of respondents fell in the 18-24 age group; 19% in the 25-43 age group; 58% in the 44-62 age group; and 20% in the 63+ age group. Thirty-five (35) states were represented in the sample.

Table 1: Self-identified Disability (pre-test)

Do you have any of the following conditions or difficulties? (mark all that apply)	
Answer Options	Response Percent
Low vision (serious difficulty seeing even when wearing glasses)	11.4%
Blindness (without usable vision)	16.2%
Hard of hearing	38.6%
Deafness	49.0%
Difficulty thinking (learning, remembering, or concentrating)	5.2%
Difficulty speaking	3.3%
Difficulty using your hands	1.9%
Difficulty walking, standing, or climbing stairs	8.6%

AWARENESS OF EAS AND NATIONAL EAS TEST

Eighty-one percent (81%) of respondents had heard of EAS and 82% of respondents were aware of the November 9, 2011 national EAS test. The top four sources where people received notice of the national EAS test were from e-mail, television news, public service announcements, and from organizations that serve people with disabilities.

ACCESSIBILITY OF EAS

Seventy percent (70%) of respondents had heard or seen an EAS message on television or radio. Sixty four percent (64%) of respondents reported no problems with EAS messages. Of the 36% of individuals who reported problems with the message, 41.9% selected “other” problems including: no captions, blocked text, text too small, text crawl too fast, audio unclear, no additional information.

Almost 39% of respondents reported it was difficult to fully understand the EAS message because they “did not hear the alert attention signal and missed part of the on-screen

information.” Eighteen percent (18%) of respondents reported that they “heard the attention signal but there was no audio describing the emergency.” Later in the report, the data is cross-tabulated by disability and the rate of occurrence for “...no audio describing the message,” for people who are blind or have low vision is significantly higher.³

Table 2: Problems Understanding EAS Message

Did you have any problems understanding the EAS message?	
Answer Options	Response Percent
Yes	35.8%
No	64.2%
What problems did you encounter?	
Answer Options	Response Percent
Did not hear the alert attention signal and missed part of the on-screen information	39.8%
Heard the attention signal but there was no audio describing the emergency	18.3%
Other problem, please describe	41.9%

When asked about NOAA weather radios, 28.7% of respondents owned one, and 32.4% had experienced problems understanding the message. Following are the challenges, identified by the respondents, to understanding EAS over NOAA weather radios: (1) lack of captioning, (2) not specific, (3) audio unclear; and (4) too many alerts, so stopped using.

ACCESSIBILITY OF EAS BY DISABILITY

Tables 3 and 4 show, by disability, whether respondents experienced problems understanding the EAS messages and the types of problems they encountered. Of the survey respondents that stated they had difficulty understating EAS messages 44.8% were hard-of-hearing, 43.1% deaf, 33.3% blind, 31.6% low vision, and 27.3% had cognitive difficulties. Eighty-

³ The aggregate data for the statistics reported in this paragraph reflect that the respondents were comprised of a greater number of people who are deaf or hard of hearing than people who are blind or have low vision; hence the higher percentage of people reporting problems hearing the attention signal.

two percent (82%) of blind respondents did not have access to EAS messages because the station or cable system carried no audio of the text crawl; 58.5% of deaf respondents did not have full access to the message because they did not hear the attention signal and missed all or part of the content. Fifty-five percent (55%) of the hard-of-hearing selected “other” in response to “What problems did you encounter?” “Other,” falls into two main categories: (1) text crawl too fast and too small, and (2) unclear audio.

Table 3: Problems Understanding EAS Message (by disability)

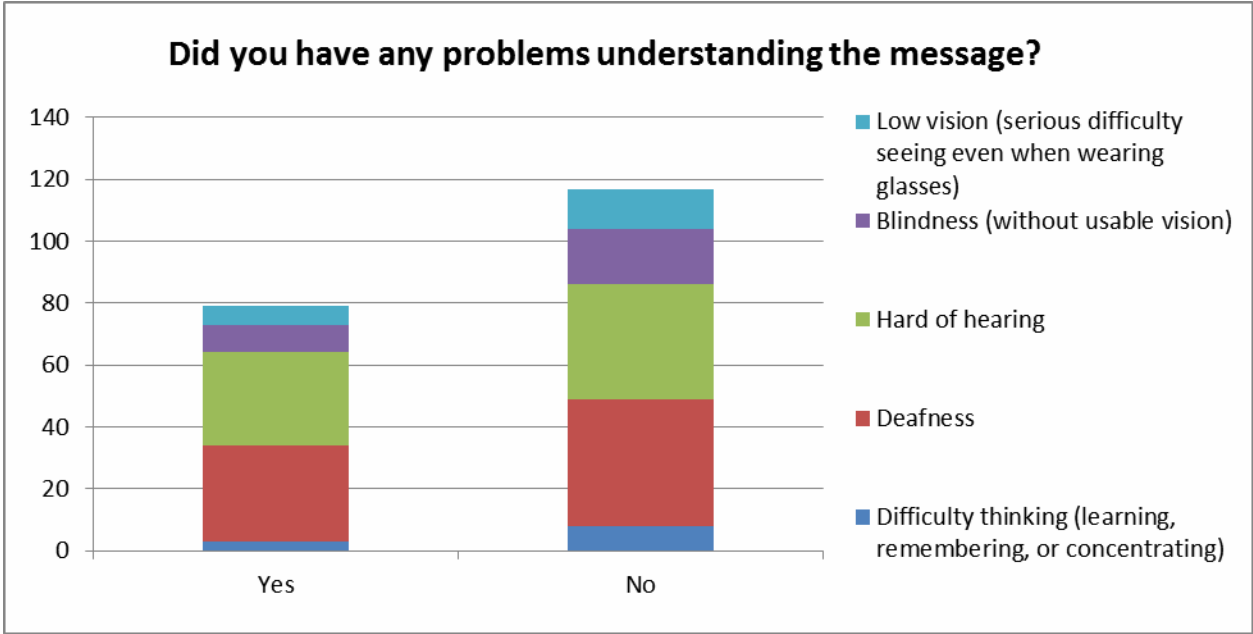
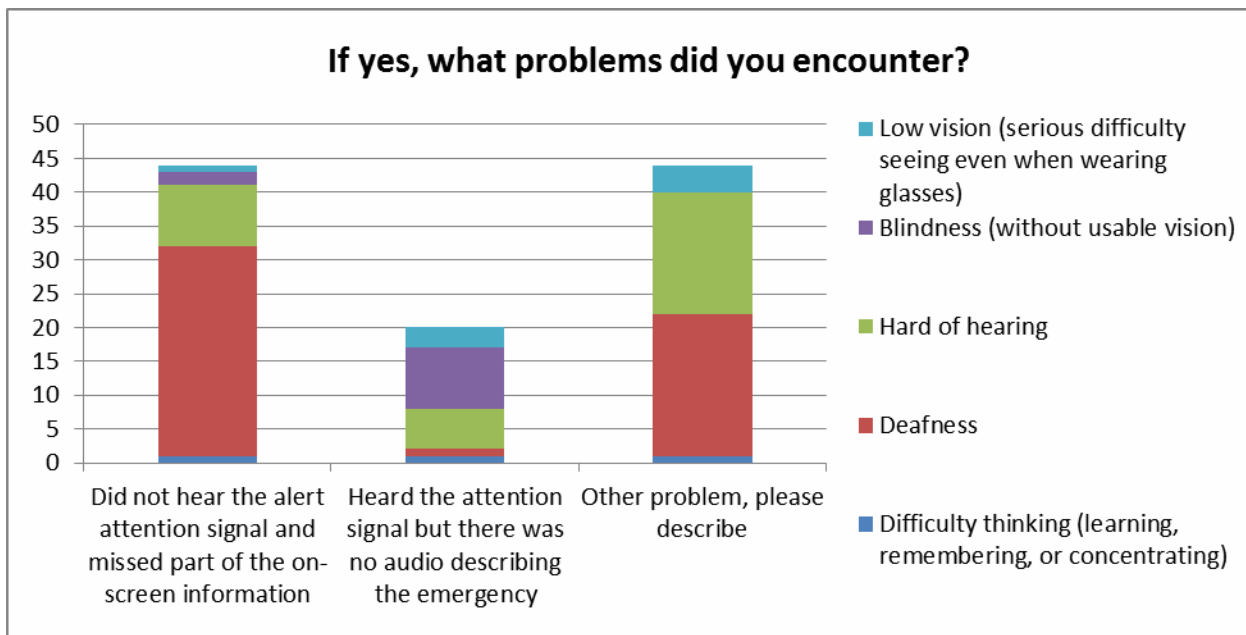


Table 4: Problems Type (by disability)



WIRELESS DEVICES AND EMERGENCY ALERTS

Table 5 shows the percentage of respondents that have received an emergency alert on a wireless device, and by what methods (i.e., text, voice call, e-mail). Nearly one third (32.6%) of respondents have received an emergency alert on their wireless device, with 53.2% receiving it via text message and 35.1% receiving it via mobile e-mail. Falling into a distant third and fourth place are voice call/message at 7.8% and mobile social networking sites at 3.9%.

Table 5: Receipt of Emergency Alerts on Wireless Devices

Have you ever received a public alert on your cell phone or any personal wireless device?	
Answer Options	Response Percent
Yes	32.6%
No	67.4%
If yes, how?	
Answer Options	Response Percent
Via text message	53.2%
Via voice call or message	7.8%
Via mobile e-mail	35.1%
Via mobile social networking website such as Twitter	3.9%

Table 6 shows cross-tabulated responses for methods of receiving mobile emergency alerts by disability. Text messages are the leading method by which respondents receive emergency alerts on their mobile devices, and mobile e-mail is second (see Table 6). Two-thirds (66.7%) of respondents with low vision receive mobile emergency alerts via text message along with 54.5% of respondents who are blind, 50% of respondents who are hard of hearing, and 48.9% of respondents who are deaf.

Table 6: Method of Mobile Emergency Alerts (by disability)

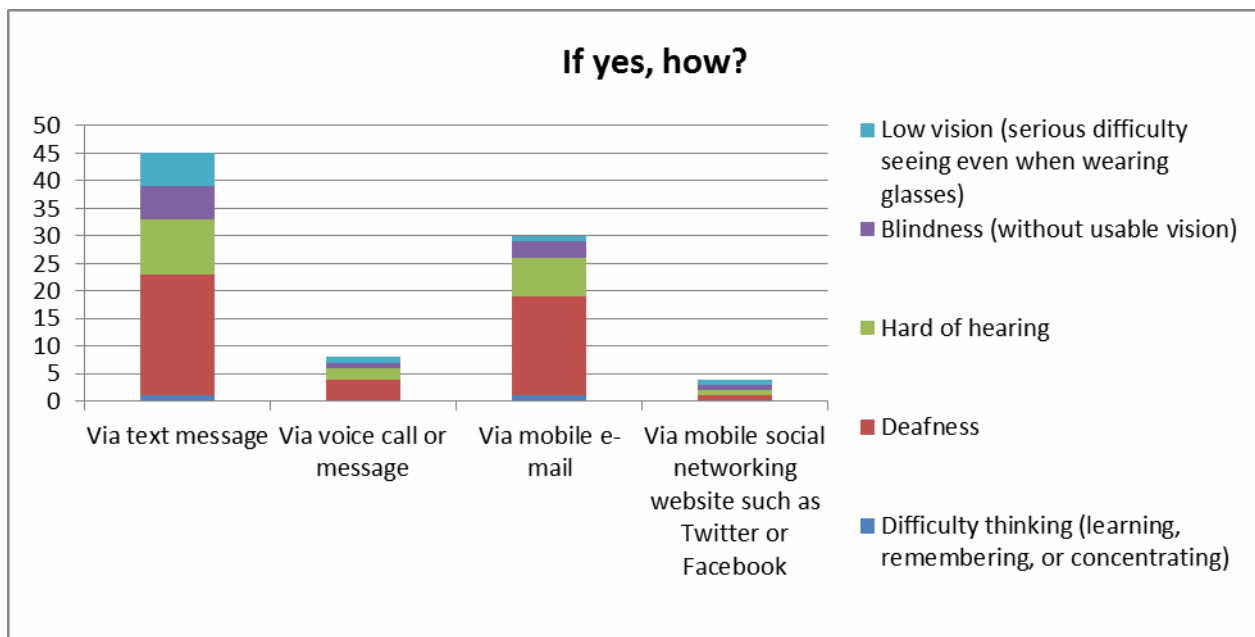


Table 7: Reaction to Mobile Emergency Alerts

When you received an alert by any of the above methods, what action(s) did you take or not take? Please check all that apply.	
Answer Options	Response Percent
Followed instruction given in the alert (i.e. stayed indoors, evacuated)	61.8%
Ignored instructions given in the alert	4.6%

Called family, friends, and/or neighbors	28.3%
Forwarded the alert message to family, friends, and/or neighbors	28.3%
Shared the alert message on a social networking site such as Twitter or Facebook	15.1%
Turned on television to receive more information	59.9%
Turned on radio to receive more information	19.1%
Searched internet to receive more information	46.1%

Table 7 shows what actions people take in response to the receipt of mobile emergency alerts. The majority of respondents (61.8%) followed the instructions given in the alert, 59.9% turned to television to receive additional information, and 46.1% searched for more information on the Internet. It is significant to note that a low percentage, 4.6% ignored the instructions given in the alert.

Individually, the percentages for calling family and friends, forwarding the alert and posting the alert to social media websites are not that high, 28.3%, 28.3% and 15.1% respectively. However, when the totals for all three are combined, 71.7% of respondents *share* the information by at least one of the three methods previously outlined.

NATIONAL EAS TEST POST-TEST SURVEY RESULTS

DEMOGRAPHIC PROFILE

There were 174 respondents to the post-test. Table 8 depicts the nature of the disability of respondents by percentage. As with the pre-test, the majority of respondents in the post-test (86.8%) self-identified as having difficulty hearing; 46.9% deaf and 40% hard-of-hearing. Thirty-three percent (33%) self-identified as having difficulty seeing; 20.6% blind and 11.9% with low vision. The average age of post-test respondents was 54.5; the eldest at 88 years old and the youngest, 18 years old. Less than one percent (.59%) of respondents fell in the 18-24 age group; 16.5% in the 25-43 age group; 55.6% in the 44-62 age group; and 27.2% in the 63+ age group. Forty states are represented in the sample.

Table 8: Self-identified Disability (post-test)

Do you have any of the following conditions or difficulties? (mark all that apply)

Answer Options	Response Percent
Low vision (serious difficulty seeing even when wearing glasses)	11.9%
Blindness (without usable vision)	20.6%
Hard of hearing	40.0%
Deafness	46.9%
Difficulty thinking (learning, remembering, or concentrating)	3.8%
Difficulty speaking	3.8%
Difficulty using your hands	4.4%
Difficulty walking, standing, or climbing stairs	16.3%

NATIONAL EAS TEST MESSAGE

Slightly less than half (45.6%) of survey respondents received the national EAS test message (Table 9). Some respondents (18%) stated that they did not receive the messages because they were not near a television or radio at the time the message was broadcast. Table 10 shows the percentages audio/visual accessibility for those that received the televised EAS test message, 62.6% did not hear the alert attention signal; 70.3% did not hear the audio message; and 53.8% did not receive the text crawl. Since the majority of the sample self-identified as having hearing limitations, it is no surprise that nearly two-thirds of respondents did not hear the alert attention signal. Table 11 shows the data by disability, revealing that 74.2% of the hard-of-hearing respondents did not hear the audio message. This is an indication that either the audio was not present, loud enough or clear enough to be discernible.

Table 9: Receipt of National EAS Test Message

On November 9, 2011, did you receive the national EAS test message?	
Answer Options	Response Percent
Yes	45.6%
No	54.4%

Table 10: Televised EAS Test Message Audio/Visual Formats

If you received the message on TV, did you:		
Answer Options	Yes	No
Hear the attention signal?	32.9%	62.6%
Hear the audio message?	23%	70.3%
See the video (crawl) message?	46.1%	53.8%

Almost half of respondents (47.4%) with hearing limitations did not see the video crawl; 45.2% of hard-of-hearing respondents and 48.9% of deaf respondents (Table 11). Below is a sample of the explanations given as to why the crawl was not seen:

- My hearing husband and I with my Cochlear Implants on, both tuned in to WPVI in Philadelphia; there was one very short sound alert and then nothing just a sign saying this is an emergency alert test. It stunk big time I am very upset as there was no verbal for the blind as well as deaf/hoh who were left out of the equation.
- I saw the words go by but it is not possible for me to read them even when I am very close to my TV. They move too fast and are not large enough. I wish that I could have heard someone read the message. The music in the background is confusing as well, it made it sound like an ad for something.
- The message was not announced. I didn't know there was any message on the TV since nothing was stated. There was only an auditory alert.
- Saw on local station that had a full screen banner. I wondered what was said.
- I switched to 3 different channels. Once the message came up that this was a test the TV station completely blacked out like if the TV was turned off. The other channels had the front notice and I just saw a glimpse of the red strip but couldn't read it. It was too small.
- For the first minute or so, there were two texts overlapping each other so I couldn't read all of the texts... then the screen changed to one text and I got to read as fast as I could.
- It was a full screen alert for 30 seconds. Like a slide show explaining the test and info, contact info etc.
- Just pulled up the message for 30 seconds and the screen became black.

- Televised EAS test message was shown very quickly less than 5 seconds. The message was unclear to convey the nature of emergency alert. Also, the background was in blue which gives a sense of lack of urgent. No video tag message to inform what kind of emergency situation there is. Also, there was no flashing message or flashing screen to grab my attention.
- Local TV said there should be a message that this was just a test. There was no such message. Also on my TV the crawl for the alert was partially obstructed by the captions.
- They are NOT close captioned or open captioned.
- I checked two channels - both have text on TV saying Emergency Alert System test. No crawlers.
- The entire staff at my office saw the EAS test on a small portable TV off the air, tuned in to WJLA TV-7. It was a thirty second graphic showing the station logo and the fact that this is the EAS test - not an emergency. At first it was hard to see, then we noticed that there was a crawl. The white lettering blended in with the predominantly white/gray graphic slide so we barely could see the crawling text on the top left and right corners of the screen where it was a light gray. Bad contrast there.

Table 11: Televised EAS Test Message Audio/Visual Formats (by disability)

If you received the message on TV, did you:		Do you have any of the following conditions or difficulties? (mark all that apply)			
Answer Options		Low vision (serious difficulty seeing even when wearing glasses)	Blindness (without usable vision)	Hard of hearing	Deafness
Hear the attention signal?					
Yes		58.30%	72.70%	48.40%	17.80%
No		47.10%	27.30%	51.60%	82.20%
Hear the audio message?					
Yes		47.10%	36.40%	25.80%	13.60%
No		58.30%	63.60%	74.20%	86.40%
See the video (crawl) message?					
Yes		53.80%	15.40%	54.80%	51.10%
No		46.20%	84.60%	45.20%	48.90%

The survey respondents who are blind or have low vision also experienced access barriers to the national EAS test message. While the majority (65.3 %) of respondents with difficulty seeing were able to hear the attention signal, 60.8% of those with visual loss did not hear the audio message (8.3% low vision and 63.6% blind). As a group, 34.7% of the respondents with difficulty seeing did not hear the attention signal; 47.1% low vision and 27.3% blind. Following is a sample of the explanations given as to why they could not hear the attention signal or audio message:

- The message didn't come through clearly.
- The video crawl message went too fast. Not all stations were describing the crawl message and the signal was not loud enough. I also have a wireless phone that does not talk or have large print or vibrates an emergency signal, should one ever have to be given by the EAS.
- In the past the speakers have talked too fast for me to be able to understand what was said, and since we have an old television it makes seeing messages across the screen difficult.

- Difficulty reading due to low vision. I could have stood up and walked to the TV to read it but because of mobility problems AND because I knew the probable content, I did not bother. When an alert of unknown type does appear I DO get up to read the message.
- I saw the words go by but it is not possible for me to read them even when I am very close to my TV. They move too fast and are not large enough. I wish that I could have heard someone read the message.
- No alert sounds and no speech explaining what was on the screen.
- In Kalamazoo the test message was partially broadcast and as I'm blind, I cannot see the video message, but my wife said that the screen was blank during the test.
- There was no audio and since I'm totally blind that's not good.
- It was only a beep, no voice message.
- The message was not announced. I didn't know there was any message on the TV since nothing was stated. There was only an auditory alert.

From these comments and the data presented it is evident that the national EAS test message did not consistently present the alert in both audio and visual formats. Without a multi-format approach to sending televised EAS alerts, a portion of the population will not have access to potentially lifesaving emergency information.

NATIONAL EAS TEST MESSAGE ON THE RADIO

A radio announcement or message is not accessible to people who are profoundly deaf, and as such, except for the few that have purchased NOAA weather radios with a text read-out, they do not use radio technology. Therefore, this section will focus on discussing survey responses of the respondents with visual loss and the hard-of-hearing. Fifty percent (50%) of respondents with low vision did not hear the attention signal on the radio; and 66.7% did not hear the entire audio message (Table 12). By contrast, 90% of respondents who are blind heard the attention signal; but only 40% heard the audio message. This may be attributed to technical difficulty on the part of the respective radio station, or with the EAS PEP system within the respective state. **Nevertheless, radio, a technology that is usually quite accessible to people who are blind or have low vision, was not consistently accessible during the national EAS test message sent over the radio. The most common reason stated was, all they heard was the attention signal and no audio of the message itself.**

Table 12: EAS Test on the Radio (by disability)

If you received the test message on the radio, did you:				
Answer Options	Do you have any or the following conditions or difficulties? (mark all that apply)			
	Low vision (serious difficulty seeing even when wearing glasses)	Blindness (without usable vision)	Hard of hearing	Deafness
Hear the attention tone?				
Yes	50.00%	90%	37.50%	9.10%
No	50%	10%	62.50%	90.90%
Hear the entire audio message?				
Yes	33.30%	40%	12.50%	3.10%
No	66.70%	60%	87.50%	96.90%

Following are a sample of explanations given as to why they experienced difficulty:

- Sometimes it can be difficult to understand someone over radio waves. They are muffled and not speaking clearly.
- All that I heard on TV and radio was "This is a TEST" and that was it.
- I did not hear the message, only the alert tone.
- There was no audio just beeps and tones.
- On the radio station, only a beep sound came across and then a buzz or grind sound. But no voice message came over.
- We only heard the beeps, but no audio explanation was given.
- Message was garbled and was played over the tone, making it impossible to understand.

Nearly two-thirds (62.5%) of respondents who are hard of hearing did not hear the attention signal; and 87.5% did not hear the entire audio message. Following are their explanations:

- I don't listen to messages when alerted by an annoying noise. I rather listen to a news broadcast or read about it later online. YOU need to fix the system to be non-annoying. My radio is already at maximum volume, I don't need to have my ears blasted.

- I had both television and radio going at the same time to test it out. It is difficult with background noise to hear both television and radio at the same time. This is why some equipment should be developed for emergency signals to be communicated to deaf/blind, hard of hearing and blind such as some form of vibrating mechanism.
- Speakers talk too fast (sounds like mumbling), and the tone is not one I can hear easily due to my hearing loss.
- The attention tone made it impossible for me to hear most of the audio message. It was annoying to have the audio message blocked out that way.
- The male voice explanation was a little garbled.
- The message (voice) was at low volume, and there was background noise, so that I could not understand the message. The attention tones were loud and clear.

SEEKING ADDITIONAL INFORMATION

After the test concluded, 23.4% of survey respondents attempted to seek additional information concerning the national EAS test (Table 13). In descending order, following are the sources/resources for additional information that people listed (non-exclusive):

- Internet (29%)
- Family, friends and/or co-workers (26%)
- Organizations for the Deaf (13%)
- E-mail (8%)
- Facebook (8%)
- FCC (3%)
- FEMA (3%)
- Phone (3%)
- TV (3%)
- Twitter (3%)

Table 13: Seeking Additional Information

After the test, did you try to get more information from other sources?		
Answer Options	Response Percent	Response Count
Yes	23.4%	32

No	76.6%	105
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NATIONAL EAS TEST FOCUS GROUPS

On November 9, 2011, during the first nationwide test of EAS, Public Broadcasting Atlanta (PBA) hosted focus groups, involving 22 members of the Atlanta community who have vision or auditory disabilities. The participants were recruited from the CAN, the Hearing Loss Association of America and the Georgia Radio Reading Service (GaRRS) listeners. They were divided into three groups:

- Deaf and hard-of-hearing (10) that discussed the televised EAS test message;
- Blind and low vision (6) that discussed the televised EAS test message; and
- Blind and low vision (6) that discussed the EAS test message delivered over the radio.

Members of these focus groups, in different locations at PBA, watched or listened to Atlanta's NPR and PBS stations, WABE 90.1FM and PBA30TV, and discussed the effectiveness of the EAS as a way to alert people with disabilities in the case of national emergencies. After listening to and/or watching the on-air EAS test message, focus group facilitators led a 90 minute discussion that addressed any problems the participants experienced receiving and understanding the message such as:

- Noticing an alert was occurring;
- Hearing the attention signal;
- Hearing the audio message;
- Seeing and understanding the video (crawl) message;
- How EAS messages could be improved;
- Problems encountered with EAS messages outside of the national test;
- Alternative emergency alerting methods/technologies; and
- Behavioral reactions to EAS messages (i.e. followed instructions, ignored, sought additional information, etc.)

Following are the nine questions and responses from these focus groups regarding the EAS national test signals that they witnessed.

Have you experienced emergency alerts in the past?

Fifteen (15) focus group participants answered this question.⁴ Thirteen (87%) had received an emergency alert by TV and/or radio; two (13%) stated they had never received an emergency alert; three (20%) had received an emergency alert on their mobile phone; and one (7%) had received emergency information from a friend who had heard the alert and shared the information.

Did you experience any problems receiving and understanding the message?

The group that responded to the televised EAS broadcast only received the still slide, then the screen resumed regular programming and a text crawl ran at the bottom of the television screen that read, "THIS IS ONLY A TEST. A primary Entry Point System has issued an Emergency Action Notification for the following counties/areas..." All of the test participants did not see the slide as it was on the television for only a few seconds. They did not receive any audio, not the alert attention signal or audio of the text crawl. For the group that was comprised of blind and low vision participants, they had to ask the facilitator what was on the screen. In their case, the test message was completely inaccessible. Responses centered on two themes: the alert's inability to capture their attention and unfamiliarity with the acronym EAS. Following are a few responses:

- It seemed a lot shorter than it was. I think several million people would miss that, it's so brief.
- People would miss it if they're doing something else in the house.
- If they're announcing a national emergency maybe they should do it more frequently, four or five time in between breaks, so people have an opportunity to catch it.
- If I was watching something on TV and it popped up, I would see it; but if I was washing the dishes, and kind of listening to the TV from another room I would not have caught it.
- There was no noise, nothing flashing or anything going on there so I probably wouldn't have noticed it.
- It says EAS. I wouldn't know what that meant. In bigger letters it should say emergency.
- I don't know what EAS means either until today. Maybe use some kind of pictures.
- Why use the acronym EAS? Why not write it out? People might blow it off or not pay attention to it. Even sighted people might not know what it stands for.

⁴ Responses are not mutually exclusive.

The blind and low vision group that responded to the EAS test on the radio received the audio attention signal. Following are their responses:

- Long silence between two signals; surprised that there were no words; no message.
- The signal came with some dead air; there needs to be an audio message(s), especially in a national test.
- Citizens need to become familiar with the three beeps as the signal for an emergency.
- Needs to be a message because we get these tones so often it is important to have some message explaining what is happening.

How could the EAS messages be improved?

Many of the focus group participants raised more questions in response to the test they experienced. Rather than providing a sense of security, that there exists a means of alerting them of an emergency, they wondered what they would experience in an actual emergency. Would the message have audio? Would they hear the tone? Would it provide information on the type of emergency and what to do? Out of these questions came a discussion on what they would prefer to see/hear. All of the deaf participants commented and agreed that American Sign Language (ASL) interpretation of the EAS crawl would be an improvement. Since the message that the participants received did not include audio there was a lot of discussion on the best methods for an EAS message to grab their attention, everything from varied frequency sounds to auxiliary aids that would vibrate a bed or flash lights throughout the house were offered as possible solutions. Additionally, many participants stated that the EAS message should not be limited to television and radio and should include mobile phones and the Internet. Based on their experience of only receiving the partial EAS test, following are their suggestions for improvement:

Regarding the test

- Would be good if they already had the test recorded, so there wouldn't be a glitch, the alert we saw gave us no information.
- Should have stated before and after it was a test. Need a re-test. We knew the test was coming but still needed to know it was a test. If it was real we needed to know what to do. Other people not in here and not knowing it was a test might panic.

Regarding attention getting methods

- If it flashed or something it would have gotten louder in my mind.
- I would put really loud audio to go along with it [the crawl].
- I would prefer something flashing to let me know this is something that is different from regular TV or radio.
- People who are hard of hearing hear at different frequencies. If you're going to use something that's audio, use a wide range, low end and high end.
- Some kind of vibration. Particularly something to vibrate your bed when an emergency happens, [or] a vibrating alarm clock.
- If we have a device in the house...it would cause lights to flash throughout the house
- A full screen message flashing. That would draw my attention.
- I think maybe more colors, like maybe a bright red to signify emergency. Maybe yellow, like the levels of the security codes.
- Some of us use attention getting devices, like strobes for when the phone rings. Is that practical?
- The graphics, the colors, they are nothing I would associate with an emergency alert system. It was all too calm, and whatever they decide to do, I think they need to brand it or advertise it or make people aware that this is what we're showing for emergencies.
- With weather alerts they show the map of where the storm is overlaid over whatever show is on – they should cut off the show and only show the alert.

Regarding including other technologies

- So much technology is available, this was limited by radio and TV – should have a national text alert.
- How it would affect marginalized communities that don't have cell phones, internet, only TV/radio – should make sure any kind of national alert covers all bases.
- I think it would be important to be able to get information on cell phones. We all carry them and use them.
- Universal design should apply; internet is here to stay, our future, every effort should be made to have emergency alerts available over the internet, radio stations, all websites.

Regarding ASL

- There needs to be an interpreter signing, as well. An interpreter on the screen signing the information for the deaf.
- Have a prerecorded ASL video that would automatically come up just like the captions or text.

Regarding the information

- The important part must be very basic. It has to be simple. Knowing that the average American adult reads on a sixth grade level. So the message cannot be too complex. If you use words like epidemic I'm not sure everybody is going to understand that. It would have to use very basic language.
- Maybe it needs to let us know what we need to do about that specific emergency. Give us a plan of action.
- I would want captions; Deaf people are not going to understand what that said up there, the symbol that was on the screen. It should be explained more clearly, something printed to go along with the symbol.

Outside of this national test, please explain any problems you have encountered in receiving and understanding EAS messages. Did your disability affect your ability to receive previous alerts?

The discussion in response to this question concentrated on the ability the individual has to receive previous alerts and the need to have both audio and visual formats for the alert message. The blind and low vision participants seem to have the least access to EAS messages. Additionally, some noted a lack of consistency in the use of audio, depending on the state they lived in at the time of the alert, the type of alert (i.e., Amber vs. weather), and/or the television station that provided service to that area. Following are specific comments:

- Hearing a plain beep, but no explanations as you hear with "Amber Alerts." Would hear beeps on television. If it were for an Amber Alert, I would hear the words, but not for other alerts.
- The only times I've had trouble are the ones at the bottom of the screen when there is a beep sound and words at the bottom of the screen but no audio. I don't know what the emergency is. When I was sighted, I could better see the text even though it was really small and scrolled so quickly.

- I can't read messages on screen. I just get a beep, but no words. It needs to have the audio words, not just a scroll on a television screen.
- Sometimes the text bleeds over from the screen. If all you hear is a beep and can't see the message how do you know what to do?
- The voices aren't always able to be understood, sounds underwater or like on a helicopter.
- Quite a difference between locations/stations in delivering alerts; it was different in Florida. Messages over Florida system were better, different scrolling at bottom of screen. Amber alerts more thorough regarding information. EAS needs to always provide more information.
- It depends on the TV station, they should all do the same thing.
- Has heard "bleed over" during EAS signals on both radio and TV in the past.
- On TV I can't understand messages. If the signal comes through a TV, then a person with vision loss' ability to understand is compromised.

Do you have a NOAA weather radio? If no, why?

Three out of twelve of the blind and low vision participants had NOAA weather radios. The participants that owned a NOAA weather radio stated it was most helpful at night when you wouldn't be listening to regular radio. One participant found it useful to take the radio when traveling. One participant did not know about a NOAA weather radio; one participant became tired of her NOAA radio and listening to the beeps when there was no real alert; and one participant has a radio with a siren.

None of the participants from the deaf and hard of hearing group owned a NOAA weather radio. One noted "I don't hear well enough to make it useful." Another participant stated, "I'm looking forward to a NOAA radio that has a flashing light or a split with my bed that will vibrate. That will be very important to me. If it were connected throughout the house, it would be broadcast all over the house." Another person stated that the problem with NOAA weather radios is that the alerts cover too large of a geographic area: "You get too many alerts so people quit using them because it wasn't in my neighborhood; it was in the next county. With cell phones or computer there is a possibility to focus alerts where they need to be..."

This discussion revealed a need to educate consumers with disabilities on the different options available for NOAA weather radios, and other forthcoming alerting methods such as the Commercial Mobile Alert System (CMAS). The deaf and hard of hearing group seemed to be under the impression that there were no accessible NOAA weather radios when in fact there are several on the market that send signals to vibrating pillows, a bed shaker or strobe lights and that have text read-outs.⁵ Additionally, a common thread among all participants is that EAS needs to be available on mobile devices so that the alerts are directly relevant to their location. Though not technically EAS, this too will be commercially available in 2012 as CMAS. Significant outreach to the disability community should be undertaken to educate them on the availability, capabilities and limitations of CMAS.

What other alerting methods have we not talked about? Have you ever received an alert on a mobile phone? Are you aware of the ReadyGeorgia app? Have you downloaded it?

All of the focus group participants thought that receiving alerts on mobile phones and Internet would be good methods of receiving alerts because they could be customized and “pushed” to the recipient. Several participants discussed social media apps. There was extensive discussion amongst the deaf and hard of hearing participants on the availability of text alerts for things like news, coupons, banking, etc. but not yet for the EAS. Most had not heard of Ready Georgia but were interested in getting it. Following are the alternative methods participants reported using:

- Phone calls
- Skype
- Cell phones
- App on phone
- Braille notes
- Texting
- City alerts
- Email
- AccuWeather
- Twitter and push notifications

⁵ See <http://www.nssl.noaa.gov/edu/safety/specialneeds.html>

In the past, when you received an alert, did you take action? If yes, what actions?

Four of the twenty-two participants explicitly stated they ignore EAS messages, two stated they ignored the alert because they assumed it was a test of the system. The majority stated they would share the information by calling family and friends or posting it on a social media site. Some seek more information on the Internet, but all focus group participants sought additional information on radio and/or television. This finding reinforces the need to educate television and radio broadcasters on the need to make emergency information accessible.

Let's discuss credibility. Do you always believe the alerts represent a real emergency situation? Do you try and authenticate the alert before you take action? For example, by contacting family or friends? Have alerts been relevant to you (i.e., if a tornado warning, did a tornado actually touchdown in your area)?

Most people found EAS alerts to be credible but nonetheless sought out additional information. Sources for additional information included the Internet, TV and other people (family, friends or neighbors). Some unique sources were also recommended, including getting celebrities to make public service announcements about EAS and because they have so many followers, to Tweet or post to Facebook emergency information when a situation arises. There was some distrust that follow-up information provided via the television was complete: "sometimes I feel the stations are withholding information to keep you listening;" revealing a perception that commercial providers of emergency information (i.e. non-governmental source) may put viewer retention above pertinent emergency details. Again, this supports the need for an official and consistent appearance of EAS messages, and mandatory provision of the same. This could bolster the public's confidence that in natural or man-made disasters, EAS will always provide timely, accurate, accessible and actionable emergency information.

CONCLUSION AND RECOMMENDATIONS

The nationwide test of EAS revealed technical, policy and practice related challenges. Technically, as evident from both the national EAS test focus groups and on-line survey results, the EAS alerts via television broadcasts were inconsistent in their use of audio and therefore not reliable or accessible to people with visual loss. For the low vision respondents and focus group

participants, the text crawl was too small and too fast to decipher. Reportedly, the test message delivered over the radio was of poor quality; this is a problem for people who are blind, have low vision and the hard-of-hearing. Respondents and participants with hearing loss also found the national EAS test message not fully accessible. The respondents who are hard of hearing found the quality of the audio poor and the attention signal not in a frequency they could hear well. The respondents who are deaf stated they would more than likely miss a televised EAS alert because there is not a visual alert mechanism. Though there are NOAA weather radios that interface with bed shakers, and lamps, and have text read outs, very few of the deaf and hard of hearing focus group participants were aware of this fact; nor were most of the participants aware of the forthcoming CMAS.

Regarding policy and practice, the current EAS requires the voluntary cooperation of private industry to deliver alerts. The voluntary nature of the system reveals the inconsistent implementation of the rules and regulations regarding state and local participation in EAS. The nationwide EAS test, which was mandatory, highlighted these inconsistent practices of EAS participants. If EAS participants do not commonly include both audio and visual formats when transmitting all EAS messages including state, local, AMBER and Presidential EAS alerts and EAS test messages, it is likely that presidential and other alerts would be inaccessible to people with sensory disabilities in various areas of the United States. Research on this topic⁶ has found that it is critical to reinforce and promote compliance and rules set by the FCC. Some rules need more “teeth” to overcome barriers to access⁷ and many stakeholders representing the interests of people with disabilities recommend that EAS participation be made mandatory.⁸

The FCC should convene a group of experts to develop a best practices guide for EAS participants to follow when presenting EAS messages. The guide would be for use by the radio, television, cable system, satellite program supplier and cellular industries. It would also be useful to emergency managers in originating alerts for EAS and CMAS. In the past, the FCC

⁶ Mitchell, H (2004). Proceedings of State of Technology Conference on Mobile Wireless Technologies, Emergency Communications: Lifeline to Public Safety, Wireless RERC, Atlanta, GA, 11-12 May

⁷ Ibid, p. 165.

⁸ See comments filed by American Foundation for the Blind, RERC on Telecommunications Access and Telecommunications for the Deaf and Hard of Hearing Inc., et al in *EAS Further Notice of Proposed Rulemaking* [EB Docket No. 04-296].

produced similar guides concerning EAS for the broadcast, cable and emergency management communities.

The Wireless RERC maintains previous recommendations^{9, 10, 11, 12, 13} to the FCC stating all emergency messages must be delivered in multiple modalities (visual/auditory) and presented in formats that are uniformly comprehensible and accessible to persons who are deaf, hard-of-hearing, blind or have low vision. Previously conducted field trials by the Wireless RERC on a prototype system to deliver mobile EAS messages, revealed that 92% of the blind and low vision participants received emergency alerts via television.¹⁴ This remains problematic, as evidence from both the national EAS test focus groups and on-line survey results which revealed that EAS alerts via television broadcasts were inconsistent in their use of audio and therefore not reliably accessible to people with visual limitations. For the low vision respondents and focus group participants, the text crawl was too small and too fast to decipher. Reportedly, the test message delivered over the radio was of poor quality, this is a problem for people who are blind, have low vision and the hard-of-hearing.

Respondents and participants with hearing loss also found the national EAS test message not fully accessible. The respondents who are hard of hearing found the quality of the audio poor and the attention signal not in a frequency they could hear well. The respondents

⁹ Wireless RERC (2010). Comments filed in Public Notice [EB Docket No. 04-296]: *Public Safety and Homeland Security Bureau Seeks Informal Comments Regarding Provisions to the FCC's Part 11 Rules Governing the Emergency Alert System Pending Adoption of the Common Alerting Protocol by the FEMA*. Federal Communications Commission: Washington, DC, May 14, 2010.

¹⁰ Wireless RERC (2010). Comment filed s in the *Second Further Notice of Proposed Rulemaking in the Matter of Review of EAS* [EB Docket No. 04-296]. Federal Communications Commission: Washington, DC, February 18, 2010.

¹¹ Wireless RERC (2007). Comments submitted to the FCC in response to *Review of the Emergency Alert System, Second Report and Order and Further Notice of Proposed Rulemaking* [EB Docket No. 04-296]. Federal Communications Commission: Washington, DC, December 3, 2007.

¹² Wireless RERC (2006). Comments filed in response to the *Further Notice of Proposed Rulemaking In the Matter of Review of EAS* [EB Docket No. 04-296]. Federal Communications Commission: Washington, DC, January 23, 2006.

¹³ Wireless RERC (2004). Comments filed in response to the *Notice of Proposed Rulemaking in the Matter of Review of EAS* [EB Docket 04-296]. Federal Communications Commission: Washington, DC, October 29, 2004.

¹⁴ Mitchell, H., et al. (2010). Ex Parte Comments filed in the open proceedings of the Emergency Alert System [04-296] and the Commercial Mobile Alert System [07-287]. Federal Communications Commission: Washington, DC, April 25, 2010.

who are deaf stated they would more than likely miss a televised EAS alert because there is not a visual alert mechanism.

The FCC and FEMA, in collaboration with organizations and agencies that work with and on behalf of people with disabilities should conduct extensive outreach to consumers with disabilities on the different options available for NOAA weather radios, and other forthcoming alerting methods such as CMAS.

Given all of this, following are the recommendations for improving the accessibility of EAS delivered over television and radio:

- Always provide audio and visual formats of alert content for all types of alerts (weather, Amber, presidential, free text).
- Standardize the appearance of EAS messages.
- Incorporate pre-recorded or rapidly assembled ASL video translation of message content.
- Include a visual alert mechanism such as a screen flash.
- Reduce the speed of the text crawl.
- Increase the size of the text crawl.
- Improve audio voice quality.
- Interrupt regular programming to accommodate a full screen alert.

The next step of the Wireless RERC will be to conduct a comparison of the two systems - EAS and CMAS - to evaluate the accessibility of CMAS once it is deployed and in use by consumers with sensory disabilities. To ensure both systems offer the accessibility features needed by people with disabilities and that challenges to the systems are minimized the Wireless RERC will identify the “best of EAS” features and the “best of CMAS” features, as well as the access barriers and challenges identified in both systems. The Wireless RERC is of the opinion that there is technology which can improve accessibility to emergencies and thereby reduce barriers that currently impede the dissemination of emergency alerts and information to people with disabilities. Equally important to technical solutions, will be strong policy and regulatory oversights that ensure public safety is extended in public alerting systems to all citizens.

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